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AUTHOR Mockovak, William P.
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ABSTRACT

The project described in this paper was developed by the Census Bureau to train census enumerators. The approach called "geographic gameboard," consists of three components: (1) an imaginary, graphically depicted community (Abbotsville, Oklahoma); (2) a census map that corresponds to the census geography of Abbotsville; and (3) blank pages for listing addresses. Abbotsville is an imaginary rural community that was purposely created to reflect a wide range of living arrangements and geographic features. Employees learn to perform their job and use census maps by canvassing and listing the mailing addresses of residences in Abbotsville. As they do this, they correct and update census geography shown on an accompanying map of Abbotsville. An important feature of the learning experience requires the enumerators to go into the field and apply what they have learned. The training program's effectiveness was evaluated by a test and a comparison was made of addresses listed by the enumerator with an "advance" listing. The high average scores obtained on the test indicate that the "gameboard" training approach was very effective in teaching important procedural knowledge. Reports from people who observed the training indicated that it achieved its goal of keeping the trainees actively involved in the learning process. The test that was administered to measure the outcome of the training program and the test results are appended. (SM)

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A New Approach for Teaching and Evaluating Map-Reading Skills

by

William P. Mockovak
Bureau of the Census
Washington, D.C.

Paper Prepared for the 10th Annual Applied Geography Conference
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*This paper reports the general results of research undertaken by Census Bureau staff. The views expressed are attributable to the author and do not necessarily reflect those of the Census Bureau.

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ABSTRACT

One of the most important steps in conducting a mail census of the United States is the development of an accurate, up-to-date list of residential mailing addresses. However, teaching census employees to read and properly update census maps to develop this address list has been a continuing problem. A significant number of census employees, even after training sessions, use maps incorrectly which leads to inefficiencies in field work and geographic problems that eventually must be corrected.

This paper describes a new approach for training census enumerators to use census maps. This approach, called the "geographic gameboard," is a training simulation consisting of three components: an imaginary, graphically-depicted community (Abbotsville, Oklahoma), a census map that corresponds to the census geography of Abbotsville, and blank pages for listing addresses.

The unique portion of this training simulation is Abbotsville - an imaginary rural community which was purposely created to reflect a wide range of living arrangements and geographic features. Employees learn to perform their job and use census maps by canvassing and listing the mailing addresses of residences in Abbotsville. As they do this, they correct and update census geography shown on an accompanying map of Abbotsville. For example, enumerators add and delete roads, correct road names, and map spot the locations of residences.

This training approach was used for the first time in 1987 to develop a list of mailing addresses in Missouri for the 1988 census dress rehearsal. This paper will report the results of observation reports and the use of an end-of-course test designed to measure the minimum skills needed by a census enumerator to perform successfully in this job.

USE OF THE GEOGRAPHIC GAMEBOARD FOR MAP-USE TRAINING

1. BACKGROUND

Although approaches for taking the decennial census of the United States have changed dramatically over the years, census maps and, specifically, correct use of those maps remains an integral part of the census.

Both in preparation for and during the 1990 census, census workers, called enumerators, will use maps to develop address lists in many areas of the United States, to assign living quarters to correct census geography, to check the completeness of address lists purchased from vendors in urban areas, and to locate households that failed to return a census questionnaire in the mail.

Obviously, the ability to use maps is a critical job skill for many census takers, but unlike general literacy, it appears the ability to read a map is lacking in a large part of our population. For example, results from a recent survey of the literacy skills of young adults [1] indicated that only 6 percent of Americans in their early 20s read below the fourth-grade level and only 5 percent could not perform "routine and uncomplicated tasks," such as reading a short sports story in a newspaper or completing a job application. However, 57 percent of young adults could not decipher a street map.

The results of this survey unfortunately have been confirmed by our own experiences with census workers using maps. Even after training sessions lasting two days, some census enumerators experience problems such as becoming disoriented, listing mailing addresses in the wrong census geography, improperly using map scales and spotting the locations of structures on maps, getting lost, and incorrectly updating census maps (e.g., adding a road in the wrong place). In addition to problems using census maps, we also discovered that some enumerators left training with a gross misunderstanding of procedures. For example, all structures in a given geographic area might have been spotted on a map, rather than just living quarters (places where people live or could live).

These problems, of course, are illustrative, and they do not mean that the majority of work performed by census enumerators is shoddy or incompetent. Nor do they imply that poorly skilled or trained workers are the source of all the problems. Particularly in the 1980 census, poor map quality was also a contributing factor. Nevertheless, the fact that such problems occur means that the Census Bureau must implement extensive quality control procedures, which raise the cost of taking the census. Our goal, therefore, has been to search for ways to improve the performance of our field workers. This search has focused on three areas:

- Improving the map-preparation process and the "useability" of the map product.
- Improving the selection of workers.
- Improving training.

Since this paper's primary interest is training, I will not discuss the major efforts that have been undertaken since 1980 to improve the quality of map products. Instead, interested readers can refer to a variety of sources describing these efforts (specifically the TIGER system) that are available from the Census Bureau.

Another subject of interest, but one which I also will not spend much time on, is selection. Obviously, if we could select persons who already knew how to use maps, our training would be greatly simplified and there should be immediate benefits for field work. Unfortunately, besides the apparent short supply of applicants with map-reading skills, the selection test presently used by the Census Bureau is unable to discriminate between those workers who can and cannot use maps. Instead, it was designed to be a general selection device and, therefore, is used to screen applicants for a wide variety of census jobs (e.g., clerical and office work, data keying, certain enumerator positions, etc.) where map reading is absent or relatively unimportant.

We have considered the alternatives of either developing a separate selection test for assessing map-reading skills or lengthening the existing test to provide better discrimination, but neither of these options has been embraced by our field managers. Because of the logistical complexity of conducting the census, the large numbers of people that must be screened and hired, as well as the inexperience which pervades all levels of the work force, our field managers have argued that an additional selection test would add unwarranted logistical complexities and costs, therefore, they have resisted it. Moreover, they report that in some areas of the country, there are inadequate numbers of applicants so that use of such a test would be meaningless for screening purposes. Using similar arguments, they have also resisted lengthening the existing test because many believe that it is already too long and complex. In fact, the trend since 1980 has been to shorten the length of the test significantly (by about 50 percent).

Instead of improving selection methods, the approach we are currently pursuing is to improve training. There are two features to this approach. First, we are examining ways to improve our delivery of training. And, second, we have implemented end-of-course tests designed to measure how much was learned during training (conceptual test) and how well the enumerator actually performed on the job immediately after training. The intent of these evaluations is to ensure that a person who leaves training is able to do the job correctly before being allowed to work. In essence, rather than use a specialized selection test, the screening process is the training itself. I will present a detailed description of the training and evaluation measures in subsequent sections of this paper.

2. THE ENUMERATOR'S JOB

It is difficult, if not impossible, in a paper such as this to describe how map-use training is conducted because it varies widely depending on the census job. However, for purposes of discussion, I will focus on one of the larger

and more important jobs that requires the use of census maps - the prelist enumerator.

Since over 90 percent of the American public will be enumerated by mail in 1990, one of the most critical steps is the development of an accurate, up-to-date mailing list of all residential addresses (occupied or vacant). After evaluations conducted in 1984, the Census Bureau decided that the most cost-effective way to develop this list was to update mailing lists purchased from vendors in urban areas, but to develop our own list from scratch in areas where we did not have the necessary resources to assign geographic codes by computer to vendor addresses. We estimate that developing our own list in rural areas will require listing the mailing addresses of about 40 million housing units (places where people live or could live). The prelist enumerator has the responsibility for developing this list.

The basic job itself is straightforward. Working in a limited geographic area, the prelist enumerator systematically travels throughout the area listing the mailing addresses of all residential structures. Since limited information is collected, only a very brief interview with a respondent is required. Nevertheless, as you might expect, there are complicating factors. In the decennial census, the Census Bureau is responsible for counting both the population and the housing stock. Although counting people is relatively straightforward, counting the places where people live requires arbitrary definitions that must be learned by enumerators. One of the most important is the Bureau's definition of living quarters. Living quarters are defined as places where people live or could live and include two basic types: housing units and special places.

A housing unit is usually an apartment, a single-family house, a condominium, a townhouse, a mobile home, or a cooperative. But, it could also be a tent, a single room, or a group of rooms in a building if it meets two criteria. Specifically, people must live and eat separately from others in the structure, and they must have direct access to their living quarters. One source of confusion between the U.S. Postal Service and the Census Bureau is that in some (often rural) areas, one mail delivery point (mailbox, P.O. Box, etc.) might service more than one distinct housing unit as defined by the Census Bureau. It is the responsibility of the prelist enumerator to identify all possible housing units so that a separate questionnaire can be delivered to each household with separate living arrangements.

Special places, on the other hand, are types of living arrangements that require different census-taking procedures. For example, prisons, motels, hospitals, halfway houses, colleges, military bases, hotels, and convalescent homes are all examples of special places. Although a prelist enumerator usually has little to do with such places (they are handled by a different census taker), they must be able to recognize them, verify their existence, and add them to our mailing list if necessary.

3. PAST TRAINING FOR PRELIST ENUMERATORS

In the past (as well as now), census enumerators were trained to do their job using a highly structured, comprehensive training guide. This guide covered the rules of canvassing, explained how to read and use census maps, presented the definitions of living quarters, and described some of the unusual situations that might occur. Whenever possible, such descriptions were supplemented by more active, skill-based training during which the enumerator actually performed the steps of the job, such as listing addresses in a address book, spotting the locations of living quarters on a map, determining the number of housing units in different types of situations, and making corrections to census maps.

Based on our analyses of this training, we believed there were four basic faults with it. First, it did not present the job as an integrated whole. Enumerators learned how to conduct the brief interview with a respondent, how to canvass, how to map spot, how to apply the housing unit definition, etc., but they learned these skills separately in different segments of the training. There was an attempt to "pull it all together" in a wrap-up exercise at the end of training, but because training time was limited, this exercise was quite short (about an hour).

Second, despite the attempt to use an active approach to learning, there was still a lot of lecture. But, perhaps more importantly, the training lasted two complete, consecutive days. For example, a typical training day might start at 9:00 a.m. and end at 4:00 or 5:00 p.m. The result was that fatigue became an impediment to learning in the afternoon. Moreover, because of the varied and different procedures being covered, some trainees were overwhelmed by the amount of material covered.

A third problem was that, because an end-of-course test was not a part of the training, we did not really know what the trainees retained when they left training.

A fourth problem was that the training sometimes presented an unrealistic picture of what the job would be like. Maps used in the training were largely error free, most of the living arrangements were straightforward, etc. Unfortunately, for many enumerators, the reality of the job was quite different when they started working.

4. POSSIBLE TRAINING ALTERNATIVES

A major problem faced in training prelist enumerators is bridging the gap between the classroom and the problems of the "real" world. Probably one of the best ways to train people to do this job would be to pair them with an expert and then have the expert train them on-the-job. With this approach, people would learn how to use a map and canvass by actually canvassing. Accordingly, they would deal firsthand with map errors or discrepancies, problems with map orientation, use of the map scale, and spotting the

locations of units.. But, most importantly, since they were accompanied by an expert, they would receive immediate feedback about their performance. This approach makes a lot of sense. Unfortunately, there's an important ingredient missing in a census - an adequate number of experts.

Census operations, such as developing a list of mailing addresses (prelist), often occur at the same time in different areas across the country. This means that training takes place concurrently in literally hundreds of locations. Although the Bureau has experts in canvassing and use of maps, there are far too few to begin even considering their use as on-the-job trainers. Instead, the "expert" becomes a highly structured training guide which is delivered by a trainer who might have been hired only a week or two before the training session.

Another alternative the Bureau has considered is the use of videobased training to provide an increased feeling of reality to the classroom training. Although this is an appealing approach, it has two major drawbacks: cost and logistical complexity. Since most training sessions occur in dispersed training sites with typically 8 to 12 people, it would be expensive to rent and distribute the necessary equipment. Moreover, there is always a concern about theft and correct use of the equipment by inexperienced trainers. Nevertheless, this approach remains an appealing option but not one we have made great progress on at this time.

Since we have not been able to solve the logistical and cost problems of videobased training, plus we lack an adequate number of experts to train people on the job, what alternatives are there other than traditional classroom approaches to the training? One possibility the Census Bureau is now testing is a training simulation which relies on a specially designed training aid. This approach is called the "geographic gameboard."

5. THE GEOGRAPHIC GAMEBOARD

If you cannot bring trainees into the real world, then the next best thing would be to bring the real world into the classroom. We have attempted to do this by developing a training simulation which consists of three parts:

1. An imaginary, rural community, called Abbotsville, which is represented graphically (dimensions: 31" X 21"). See Figure 1 for an illustration of one small part of Abbotsville.

2. A census map which corresponds to an enumerator assignment area covering most of Abbotsville. See Figure 2 for an illustration of the corresponding part of Figure 1.

3. Blank pages which are used to list mailing addresses. See Attachment A.

We decided to create a rural community, Abbotsville, for use in the simulation because that's the type of community where most of our map reading problems occur. The living arrangements represented on Abbotsville and the accompanying geography were purposely designed to reflect situations which we know have caused problems for enumerators in previous census work. The important point to remember is that for training purposes, Abbotsville represents "reality." It was designed to present information that an enumerator would be able to obtain by either walking or driving around the area. Therefore, structures are represented, in most cases road names are available, and local landmarks (churches, schools, etc.) are present. In addition to common geographic features (roads, lakes, rivers, railroads, etc.), we included the following types of situations which have caused problems for enumerators in the past:

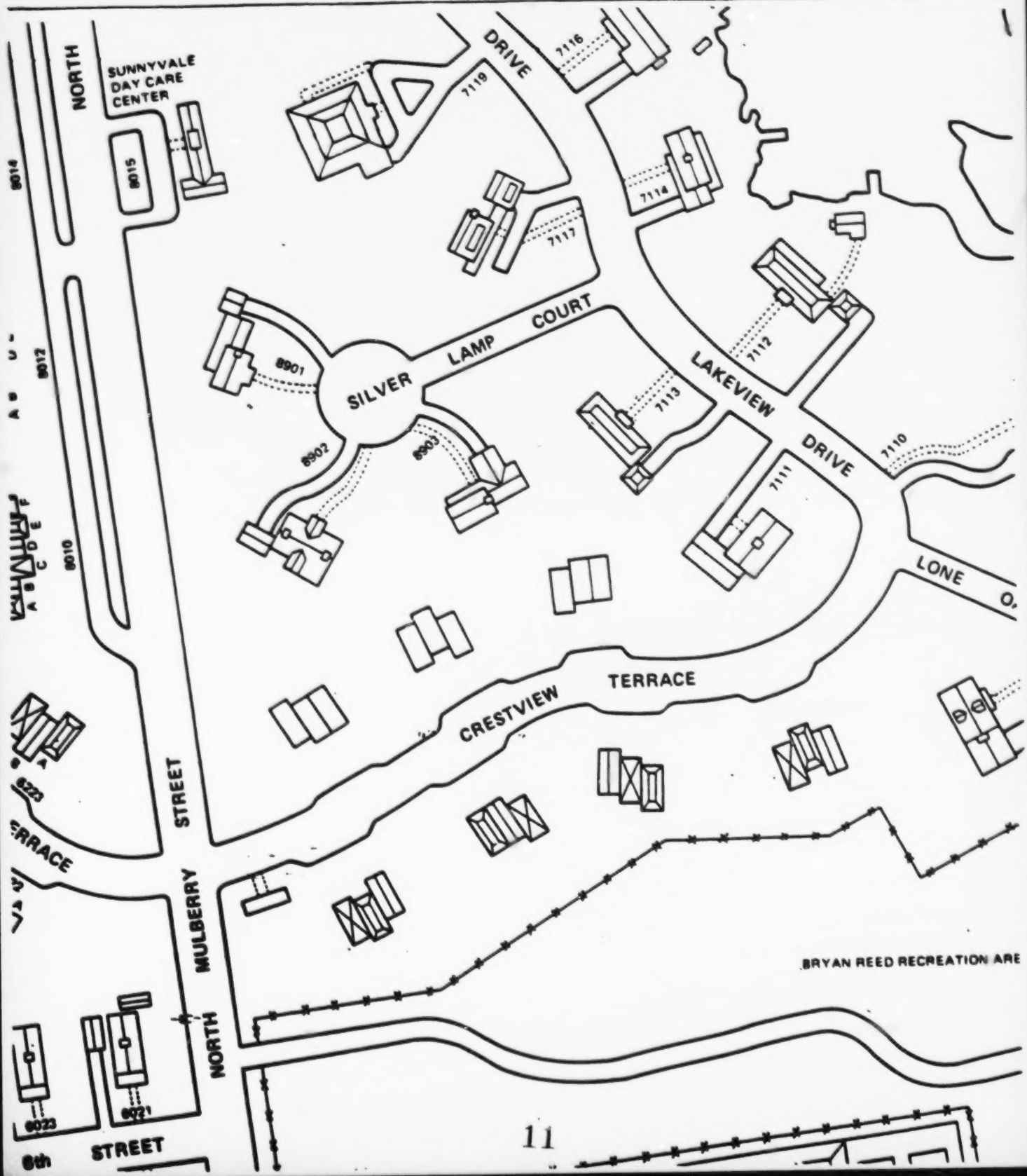
- Roads (e.g., new housing developments, rural roads) exist in Abbotsville but are not shown on the census map.
- Roads are shown on the census map that do not exist in Abbotsville.
- Roads are unnamed on the census map and either named or unnamed in Abbotsville.
- Geographic boundaries for the enumerator assignment area include both visible (e.g., road features) and invisible boundaries (e.g., political boundaries).
- Standard, as well as irregularly shaped blocks, are present in Abbotsville and are also shown on the census map.
- Less common map symbology, such as street extensions, are shown on the census map.
- Names of roads differ between Abbotsville and the census map.
- Changes in zip code areas occur in the enumerator's assignment area.

In addition to representing geographic situations which we know have caused problems, we also represented living arrangements on Abbotsville that have led to enumerator errors in listing mailing addresses. For example, we included the following types of living arrangements:

- Special places, such as convalescent homes and motels.
- A trailer/mobile home park.
- Living quarters in various stages of construction.
- Migrant worker and seasonal housing units.

Figure 2
Illustration of Census Map
(NOTE: Silver Lamp Court shown in Figure 1 must be added by the enumerator to Block 212.)

Figure 1
A Portion of Abbotsville (actual size)



- o Vacant, abandoned, and condemned housing units.
- o Places that should not be listed such as high schools and day care centers.
- o Different types of mail delivery, such as house number/street name (easiest and most common), rural route delivery, general delivery.
- o Discrepancies between mailing addresses and location descriptions (e.g., a good location description might be 4500 County Rd. 25, but the mailing address might be Box 6, Rural Route 2).

Our objective in designing Abbotsville was to create an imaginary community that gave enumerators a realistic picture of the types of geographic and procedural problems that they might encounter on the job. In the training developed to date, we have used only one such representation (we do not call Abbotsville a map to avoid confusion with the accompanying census map), but there is no reason that more than one could not be used. In fact, for different types of census training requiring maps, different representations would be required for maximum instructional effectiveness. It is also important to emphasize that the training being described was prepared for 1987. Changes planned for the training will be described at the end of this paper.

5.1 DESIGN OF THE GAMEBOARD (ABBOTSVILLE) TRAINING

The training using Abbotsville consists of a self-study (completed at home), plus two and a half days of training, of which one half day consists of actual work on the job. The separate components are sequenced as follows:

1. A brief (about one hour) self-study precedes classroom training. This is designed to present a general overview of the job and to introduce map products and census vocabulary.
2. A full day of classroom training (about 6-7 hours) which covers canvassing, map use, and application of the most common census procedures.
3. A morning classroom session on the second day which picks up where the previous day left off. Following this session, the enumerator actually goes into the field and in the afternoon lists residential mailing addresses in her or his assignment area.
4. On the morning of the third day, enumerators return to the classroom to discuss their experiences from the previous day, clear up any problems or confusions that resulted, and discuss any unusual situations that appear unique to their assignment areas.

Following this discussion, the enumerators cover unusual or atypical situations that may occur in their field work (in fact, some may already have been encountered by enumerators), and then they learn how to fill out payroll and progress report forms.

5. The training on the third day ends with the enumerators taking an end-of-course test. In addition to this test, enumerator performance from the preceding afternoon is evaluated by comparing it with the results of an advance listing (completed by a different enumerator) of a limited number of addresses in their assignment areas. Therefore, proficiency at the end of training is evaluated by both a knowledge test and a skill test. The trainer uses the results of these evaluations to decide which enumerators need additional training (on-the-job) or which should be released because they apparently are unable to do the work.

5.2 IMPORTANT FEATURES OF THE TRAINING

This training design has several features worth pointing out. First, unlike previous census training that covered this material, an integral part of this training requires the enumerator to go out into the field and apply what she or he has been learning in the classroom. Therefore, when the person returns to the classroom on the third day, there is an opportunity to review problems, misconceptions, or ambiguous procedures that had been covered up to that point in the training. Also, there is the opportunity to discuss local situations that may be quite common (e.g., seasonal housing in a resort community) in their assignment areas but not stressed in training designed for the entire United States.

Another important feature is that, with the exception of the first day, the training is limited to half days. Our experience has indicated that training which extends beyond a half day loses much of its effectiveness.

A third feature, which is not apparent from the preceding discussion, is that by using the Abbotsville simulation, the training is presented in an integrated fashion and the enumerator learns the job by doing it. For example, using the census map, the enumerator learns to orient the map, to determine his/her location on the map, and to canvass blocks in Abbotsville.

As each structure (possible living quarters) is encountered, role playing is used to present the class with descriptive information which includes both mailing address information, as well as information about other possible living quarters on the property. However, by design, not all structures encountered should be listed. Only the mailing addresses for places where people live or could live are included.

Initially in the training, these role plays are straightforward, but as the training progresses, complexities such as additional housing units or unusual living arrangements are introduced. During each interview at a housing unit, the enumerators enter the mailing address in the address register and spot the

location of the unit on the census map. These steps are identical to what they would do while working. Accordingly, they get practice applying census definitions, listing the addresses, preparing adequate location descriptions which could be used by enumerators in later census operations, and using map scales to spot the correct location of housing units. As this exercise progresses through the first day and a half of training, the trainer can also check the work of each enumerator to ensure that they are making correct entries and understand the training to that point.

In addition to encountering different types of housing arrangements and troublesome situations, as the enumerators canvass Abbotsville, they also encounter more difficult canvassing problems and a variety of geographic problems (i.e., inconsistencies between the map and reality). Again, a similar strategy is used. The training starts with simple, uncomplicated situations and then gradually increases in complexity. The intent is to make the enumerators aware that their maps will <u>not</u> be perfect and that they will be expected to make corrections and to update them.

5.3 EVALUATIONS OF THE EFFECTIVENESS OF TRAINING

As noted briefly, the effectiveness of the training was evaluated using two approaches: one was a test given at the end of training, and the other was a comparison of some of the addresses listed by an enumerator on the second day of training with an "advance" listing done previously by another enumerator. The intent of both of these evaluations was to ensure that enumerators possessed a minimum level of knowledge and skills before they were allowed to work. Because the data are not yet available, evaluation results from the advance listing will not be discussed in this paper. Instead, the focus will be on the end-of-course exercise (test) given in class at the conclusion of training.

5.3.1 THE END-OF-COURSE TEST

Although test-like questions and tests have been used previously in census training, there were two unique features about this test.

1. First, it was designed systematically by a group of content experts so that a "passing" score would result which represented the minimum knowledge and skills required by a borderline enumerator.

2. Second, if an enumerator did not achieve a passing score, she or he would either be retrained or released.

The approach used to develop test items and a passing score was a variation of Nedelsky's method described in Livingston and Zieky (1982) [2]. This approach requires the following five basic steps:

1. Select the experts (judges).
2. Define "borderline" knowledge and skills.
3. Train the judges.
4. Collect judgments.
5. Combine the judgments to choose a passing score.

The 47-item test that resulted is shown as Attachment B. (Each part of question 3 was counted as a separate item for scoring purposes.) The passing score for this test was estimated to be 25 for a borderline test-taker.

5.3.2 TEST RESULTS

The training described in this report was used in a test census conducted in 1987 in Missouri and Washington. Final review exercises (tests) were available for analysis from 143 enumerators who were trained as prelist enumerators.

Table 1 shows the frequency distribution of scores for these enumerators. The average score on the final review exercise was 42.3 with a standard deviation of 3.29. Our belief is that, even if our group of experts set the passing score too low, the high average score indicates that training using the "gameboard" approach was very effective in teaching important procedural knowledge. Attachment C shows the performance of the group on individual items of the test. Based on this analysis, one important skill which needs additional emphasis in training is use of the map scale (item 22).

Somewhat surprisingly, no enumerator in this sample failed the test. We may therefore want to consider making the test more difficult by changing the mix of items or purposely creating more difficult items. We will have to pursue this matter further by correlating test scores with field performance to determine the empirical validity of the present passing score. At this time, however, it is important to note that the present test was viewed as a fair representation of the knowledge and skills necessary to do the prelist enumerator's job.

Table 1
Frequency Distribution of Enumerator Scores on Final Test
(N = 143)

Score	Frequency	Percent	Cumulative Percent
25	1	.7	.7
33	1	.7	1.4
34	2	1.4	2.8
35	1	.7	3.5
36	1	.7	4.2
37	5	3.5	7.7
38	7	4.9	12.6
39	8	5.6	18.2
40	7	4.9	23.1
41	11	7.7	30.8
42	19	13.3	44.1
43	22	15.4	59.4
44	22	15.4	74.8
45	15	10.5	85.3
46	17	11.9	97.2
47	4	2.8	100.0

Mean = 42.3 Standard Deviation = 3.29

6. REACTIONS FROM OBSERVERS AND FUTURE PLANS

Reports from people who observed the training indicated that it achieved its goal of keeping the trainees actively involved in the learning process. Interest level and participation remained high throughout the training session. Therefore, as an instructional device, the basic approach seems sound. However, as with any new approach, we have identified areas of potential improvement.

The most significant criticism from one test area (East Central Missouri) was that the situations simulated on Abbotsville were not realistic enough. Consequently, enumerators suffered "map shock" when they started working. Problems encountered in the field, but not simulated on Abbotsville, included multiple map sheets and insets for an assignment area (Abbotsville used only one map sheet and no insets), blocks which were not numbered consecutively, blocks which extended over more than one map sheet, assignment area and block boundaries in the middle of lakes and rivers, highly irregular block shapes, and block numbers assigned to unusual geographic features such as highway medians or cloverleafs. In addition, a general criticism was that Abbotsville was not "rural" enough in its depiction of geographic features.

We do not question the validity of these criticisms, but they point out the problems we face in attempting to develop standardized map-use training for the entire nation. A training designer, faced with a limited training period, must decide which training content will be covered and how much emphasis it will receive. In addition, assumptions must be made about the map products and the types of irregularities that may occur. Abbotsville was designed, based on past experiences, to represent a spectrum of problems, but the test census (prelist for the dress rehearsal) in East Central Missouri raised a host of others, as will each section of the country.

Some of the existing problems can be attributed to the development of our map-production system (TIGER) and refinements that need to made to it. Still, I believe the lesson is clear that we need to increase the variety and difficulty of geographic situations represented on Abbotsville. Therefore, the most important immediate improvement will be to redesign Abbotsville so that a greater variety of geographic situations will be represented. In addition, we will attempt to better "tailor" the training to local differences. This will be accomplished by modifying Abbotsville so that three separate enumerator assignment areas are created, instead of the single one that currently exists.

The first of these assignment areas will reflect a combination of urban and rural geographic features and living arrangements and all persons being trained as prelist enumerators will receive this training. A second assignment area will be rural in nature, and the third will be primarily urban.

Accordingly, enumerators who will be working in primarily rural areas will be trained on the "combination" assignment area and then given supplemental (tailored) training on the rural assignment area. Similarly, enumerators who will be working in primarily urban areas will be trained on the "combination" assignment area and then given supplemental training on the urban assignment area. In addition, supplemental instructions (for example, handouts) will be used in areas with large numbers of seasonal housing units or other unusual characteristics. These instructions will be used on an "as needed" basis since only small areas of the country are affected.

Other plans we are pursuing involve the use of the gameboard simulation approach in current, ongoing survey work. Specifically, we plan to conduct a formal evaluation which compares use of the gameboard with our standard, traditional approach for training interviewers to list addresses.

7. REFERENCES

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2. Livingston, S.A. & Zieky, M.J. Passing Scores. Educational Testing Service, 1982.

ATTACHMENT A

OMB No. xxxx-xxxx Approval Expires xx xx, xxxx

Block No. (1)	Map spot No. (2)	What is the exact MAILING ADDRESS of this living quarters? — MAILING ADDRESS: House No. (3)	Street name, rural route and box No., or P.O. box No. (4)	Apartment No., unit designation, or trailer (5)	City (6a)	State (6b)	ZIP Code (5 digits) (6c)	FILL ONLY IF COLUMN (3) IS BLANK — What is the FULL name of the occupant? First, middle initial, last (7)	Road name (8)	PHYSICAL LOCATION — How would you describe the location of this place? Use abbreviations – For example: The Hse ½ mi S of Sunset Dr (9)	Error – "X" if 10 + bldg (10)	"V" if vacant (11)	Fill col. (14) "S" if special place (12)	Fill col. (14) "C" if cluster (13)	Remarks — If column (12) is marked "S," enter special place name/type. If column (13) is marked "C," enter estimate of HU's in cluster (14)

REVIEW EXERCISE

Instructions: Pick the best answer to each of the following questions. Enter your answers on the accompanying answer sheet by circling the correct choice.

You will have 45 minutes to complete this exercise. You may use your blue pages.

1. How does the Census Bureau define a housing unit?

   a. It must have direct access (separate entrance from the outside or from a common hallway)
   b. People living there must live and eat separately from others
   c. The place must be occupied - people must live there
   d. a & b
   e. a, b & c

2. Why is the Census Bureau developing a list of mailing addresses?

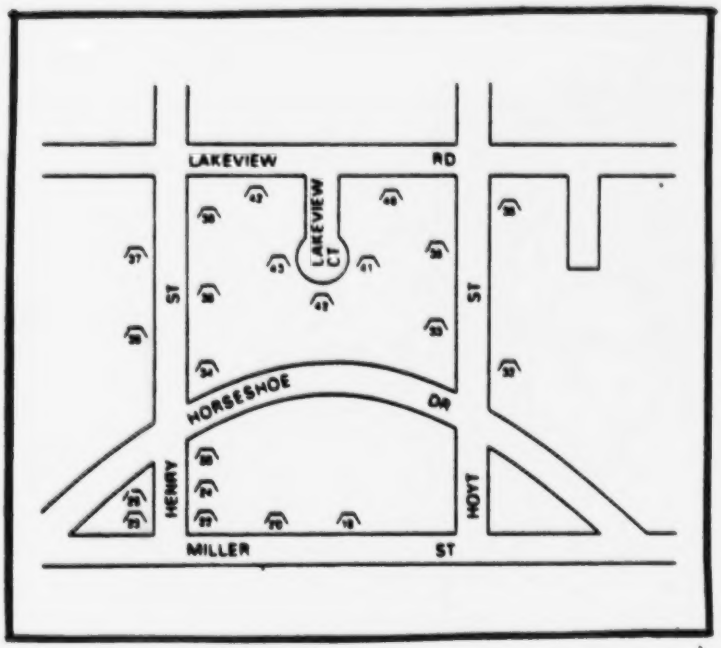
   a. To evaluate the effectiveness of the 1980 census
   b. So census questionnaires can be mailed or dropped off at those addresses
   c. To sell to other government agencies for surveys they do
   d. None of the above

3. Indicate by circling "yes" or "no" which of the following types of places would be listed in your address register (include both housing units and special places):

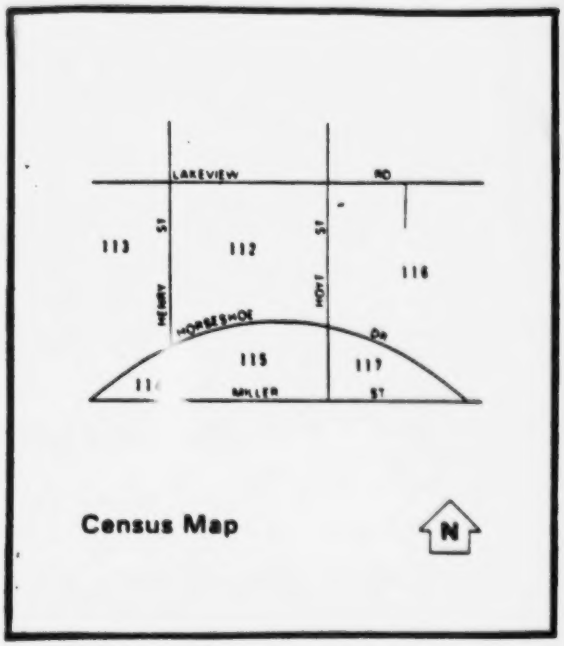
a.	An occupied mobile home or trailer	yes	no
b.	A vacant mobile home or trailer	yes	no
c.	A cement pad for a trailer in a trailer park	yes	no
d.	A vacant house	yes	no
e.	A building used to store tools & equipment	yes	no
f.	A church	yes	no
g.	A public elementary school	yes	no
h.	A business like a hardware store or dress shop	yes	no
i.	A cabin used only during hunting season	yes	no
j.	A motel	yes	no
k.	A hospital	yes	no
l.	A prison	yes	no
m.	A campground	yes	no
n.	A day school for children whose parents work	yes	no
o.	A boarding school	yes	no
p.	A house under construction with final doors and windows in place	yes	no
q.	Cabins for seasonal migrant workers	yes	no
r.	A vacant house with a condemned sign	yes	no

Figure 1

1a - Assignment Area



1b - Census Map



Questions 4 to 11 refer to Figure 1 above. This illustration shows part of your assignment area and the corresponding census map.

4. If you were traveling south on Hoyt St. between Horseshoe Drive and Lakeview Rd, which block would be on your right?

   a. 112
   b. 115
   c. 116
   d. 117

5. If you started canvassing block 115 at the corner of Miller Street and Henry Street, which addresses would be listed in block 115?

   a. 24 & 26 Henry Street
   b. 22, 24 & 26 Henry Street
   c. 22, 23, 24, 25 & 26 Henry Street
   d. 22, 24 & 26 Henry Street and 18 and 20 Miller Street

6. After you finish canvassing block 115, which block would you canvass next?

   a. 112
   b. 114
   c. 116
   d. 117

7. The interior road shown in block 116 does not have a name, what would you do on your census map?

   a. Cross it out
   b. Give it a name
   c. Call it "UN RD A" (for unnamed road A)
   d. Draw a circle around it

8. If you canvass block 112 correctly, you will travel _____ on Henry Street and _____ on Lakeview.

   a. North, East
   b. South, East
   c. North, West
   d. South, West

9. If the portion of Hoyt Street in block 115 between Horseshoe Drive and Miller Street did not have any living quarters on it, what entry would you make on your census map?

   a. Nothing, leave it blank
   b. Print "No LQ" for "No Living Quarters"
   c. Put a box around the block number
   d. Enter a map spot with a zero

10. If there were no living quarters in an entire block, what would you do?

    a. Cross out the block on the census map
    b. Draw a box around the block number on the census map
    c. Print the block number on a line of the listing page with the entry "No LQ"
    d. Do nothing - leave as is

11. Notice that Lakeview Ct. exists in the assignment area but is not shown on your census map. What would you do?

    a. Add the road to the map
    b. Map spot the living quarters on Lakeview Ct.
    c. Both a & b

12. You are canvassing a block when you come to an alley. The alley is not named, and a clerk in the store on the corner says it is used only for deliveries. What do you do?

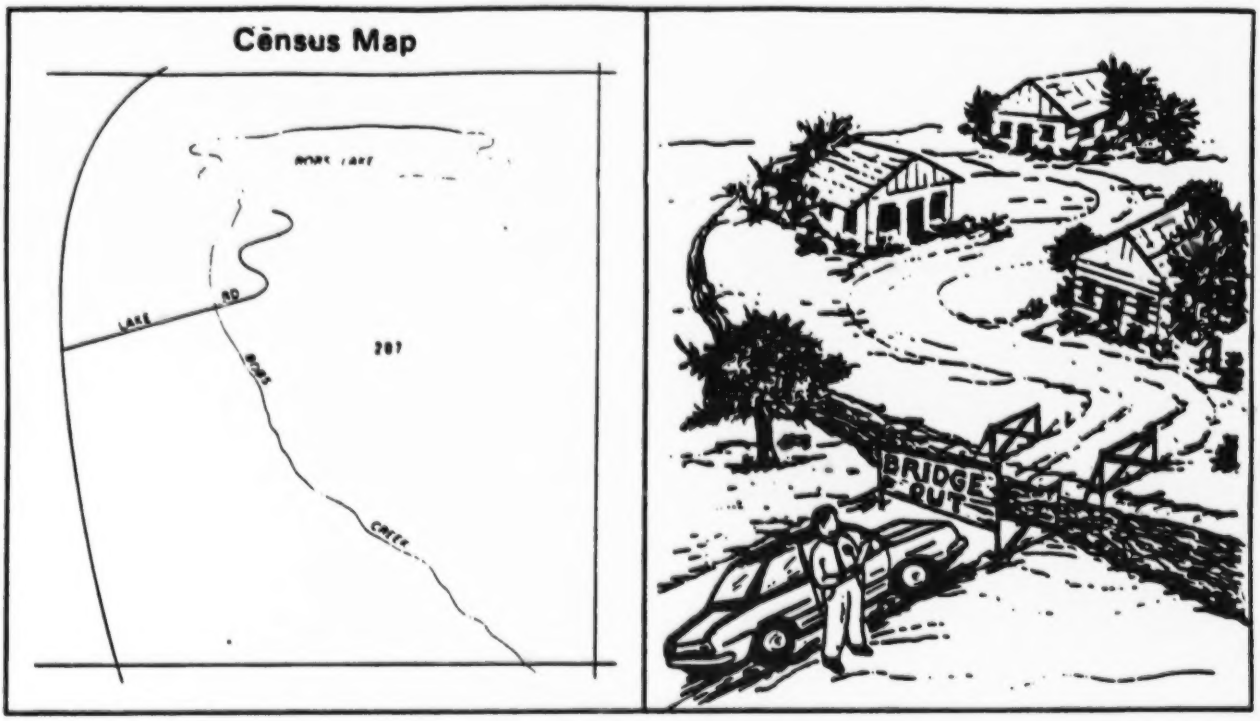
    a. Draw the alley on your map and label it "UN RD A," only if it is the first unnamed road in that block

    b. Nothing - leave the map as is
    c. Draw the alley on the map, but do not name it
    d. None of the above

13. A map spot on a census map refers to:

    a. The location of the mailbox where mail is delivered for that address
    b. The location of the living quarters
    c. Only multiunit (apartment) buildings
    d. None of the above

CENSUS MAP



14. In the illustration above, the enumerator, while canvassing block 207, discovers that the bridge on Lake Rd crossing Bob's Creek is out and will not be repaired for at least a month. Several summer cabins are clearly visible on the other side of the creek. The enumerator should:

    a. Return in a month
    b. "X" out Lake Rd on the other side of the creek because it is impassable
    c. Map spot and enter a location description for each cabin the enumerator sees
    d. Map spot and list the cabins on the other side of the creek as a cluster

15. You are listing in your ARA when you come to an apartment building. The front door is locked, and there are no tenants around to let you in. What must you do?

    a. List the building as a cluster
    b. Fill a refusal record
    c. List the building as a special place
    d. Try to contact the building manager, owner, or real estate representative so you can get in the building

DX-635.2

Block no.	Serial no.	What is the exact MAILING ADDRESS of this living quarters? MAILING ADDRESS: House no.	Street name, rural route and box no., or P.O. box no.	Apartment no., unit designation, or letter	City	State	ZIP Code (5 digits)	FILL ONLY IF COLUMN 13 IS BLANK: What is the FULL name of the occupant? First, middle initial, last	Road name	PHYSICAL LOCATION: How would you describe the location of this place? Use abbreviations — For example: The Map ½ mi S of Sunset Dr	Entry — Basic (100-block)	Entry — Vacant	For rural routes: Rural route no.	For rural routes: Box no.	Remarks: If column 11A is marked "S" enter special place name/description. If column 11B is marked "C" enter explanation of why it is checked.
101	1		P.O. Box 299		AUSTWELL	TX	75104			INT OF LAKE RD & I-25			S		MOTEL 6
101	2		RR BX 190		↓	↓	↓	GLENN A. WYATT	ADAMS RD	RED TRLR ½ MI S ON ADAMS RD.					
101	3		RR BX 450					JOHN BLACKWELL	SAMUEL RD	RED BRICK HSE ¼ MI N ON SAMUEL RD					
101	4		RR BX 457					THOMAS BLACKWELL	SAMUEL RD	GR TRLR BEHIND RED BRICK HSE ¼ MI N ON SAMUEL RD					
102	1	23	LAKE RD												
102	2	25	↓												

Page ____ of ____ pages

DX-101A

ADDRESS LISTING PAGE
1980 CENSUS
21st Decennial Census

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

Ask the following questions at each address. A box must be filled for each living quarters.

P31 Are there any other living quarters occupied or vacant, in this building or on this property?

Questions 16 to 19 refer to the illustration on page 8.

16. Which of the map spot numbers in block 101 refer to a special place

    a. 1
    b. 2
    c. 3
    d. 4

17. What entry did the enumerator forget to make for map spot numbers 2 and 4 in block 101?

    a. Forgot to print out the name of the city and state
    b. Left out the zip code
    c. The abbreviation "TRLR" is missing in column (5)
    d. The physical location description in column (9) is confusing

18. How would you list a townhouse complex of 25 townhouses?

    a. List each townhouse on a separate line of the listing page
    b. List the townhouse complex as a 10+ building
    c. Check the special place pages to see if the townhouse complex is listed there
    d. List the townhouse complex as a special place

19. A location description must be entered in column (9) whenever:

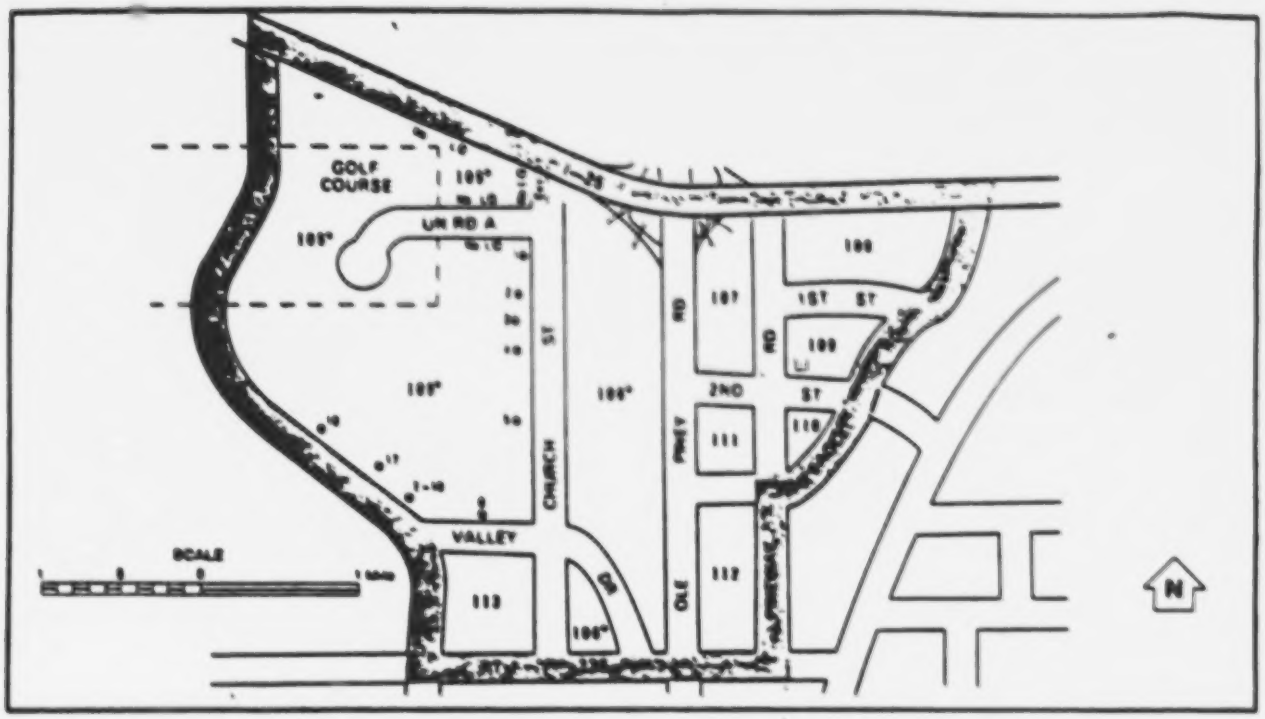
    a. You will have to return to the living quarters and don't think you could find it without directions
    b. The living quarters is difficult to locate
    c. The living quarters has a house number and street name address
    d. The mailing address is either a Post Office (P.O.) box or Rural Route (RR)

20. What, if anything, is wrong with the location description for map spot number 4 in block 101?

    a. The abbreviation for green (GR) is wrong
    b. Samuel should be Sam
    c. It is too long
    d. Everything is fine.

21. You are canvassing when you come to four trailers set back from the road. A sign in front says TOM'S TRAILER PARK. The trailers are too close together to map spot individually. What should you do?

    a. List them as a cluster
    b. List each trailer separately and assign a range of numbers to one map spot
    c. List TOMS TRAILER PARK as a special place
    d. None of the above



Questions 21 to 28 refer to the illustration of an ARA above.

22. The distance along Church St., from Valley Drive to the unnamed road that leads to the golf course, is about:

    a. 1 and 1/2 miles
    b. 2 miles
    c. 2 and 1/2 miles
    d. 3 miles

23. An asterisk (*) is used on a census map when:

    a. The block has special places within it
    b. The block is an unusual block with many problem that you need to be aware
    c. The block number is printed more than once
    d. The block is big

24. A street extension is part of the boundary between blocks:

    a. 105 and 106
    b. 105 and 113
    c. 110 and 111
    d. 107 and 111

25. Are there any living quarters in this ARA south of Rt 235?

    a. yes
    b. no

26. If while canvassing block 108 you discover that 1st Street does not exist, what would you do?

    a. Correct the map by X'ing it out
    b. Do nothing - leave the map as is
    c. Tell my crew leader
    d. None of the above

27. If 1st Street does not exist, where would you list the addresses of living quarters in blocks 108 and 109?

    a. I would list them under block 108
    b. I would list them under block 109
    c. I would list them in the blocks shown on the census map
    d. I would create a block, called UN BLK A and list them in that

28. Assume the enumerator finished canvassing block 105. How many living quarters (including special places and housing units) did the enumerator find?

    a. 10
    b. 18
    c. 30
    d. 46

29. If the enumerator finished canvassing block 105, what did the enumerator forget to do?

    a. Forgot to start with the number 1 for the first map spot in the block
    b. Forgot to circle the block number when canvassing was completed
    c. Forgot to canvass in a clockwise direction
    d. None of the above

30. What are some ways to determine the location of an invisible boundary on your census map?

    a. Use your car odometer to estimate the distance from a visible feature on the map, for example, an intersection or a river
    b. Look for signs on the road
    c. Ask residents where the line is
    d. All of the above

ATTACHMENT C

Enumerator Performance On Individual Test Items

(Note: The correct answer is marked by an asterisk.
Also, proportions do not sum to 1.0 for all items
due to rounding errors.)

1.	a. .02	b. .02	c. .01	*d. .87	e. .08			
2.	a. .01	*b. .78	c. .01	d. .19				
3.	a.	*yes 0.99	no 0.0					
	b.	*yes 1.0	no 0.0					
	c.	*yes 0.87	no 0.13					
	d.	*yes 0.99	no 0.01					
	e.	yes 0.01	*no 0.99					
	f.	yes 0.02	*no 0.98					
	g.	yes 0.03	*no 0.97					
	h.	yes 0.03	*no 0.97					
	i.	*yes 0.80	no 0.20					
	j.	*yes 0.97	no 0.03					
	k.	*yes 0.89	no 0.11					
	l.	*yes 0.94	no 0.06					
	m.	*yes 0.74	no 0.26					
	n.	yes 0.06	*no 0.94					
	o.	*yes 0.78	no 0.22					
	p.	*yes 0.98	no 0.02					
	q.	*yes 0.97	no 0.03					
	r.	yes 0.02	*no 0.97					
4.	*a. .90	b. .01	c. .10	d. .00				
5.	a. .01	b. .26	c. .01	*d. .72				
6.	a. .03	b. .04	*c. .92	d. .01				
7.	a. .04	b. .02	*c. .94	d. .00				
8.	*a. .93	b. .03	c. .03	d. .02				
9.	a. .01	*b. .98	c. .01	d. .00				
10.	a. .00	b. .03	*c. .97	d. .00				
11.	a. .05	b. .00	*c. .95					
12.	a. .27	*b. .65	c. .02	d. .06				
13.	a. .01	*b. .99	c. .00	d. .00				
14.	a. .01	b. .01	c. .13	*d. .86				

15. a. .03 b. .10 c. .02 *d. .85

16. *a. 1.0 b. .00 c. .00 d. .00

17. a. .00 b. .01 *c. .96 d. .04

18. *a. .72 b. .25 c. .02 d. .02

19. a. .04 b. .03 c. .00 *d. .94

20. a. .01 c. .00 *c. .80 d. .17

21. a. .01 *b. .94 c. .03 d. .02

22. a. 41 *b. 58 c. .01 d. .01

23. a. .00 b. .01 *c. .99 d. .00

24. *a. .86 b. .06 c. .08 d. .01

25. yes .05 *no .94

26. *a. .99 b. .00 c. .01 d. .01

27. a. .03 b. .02 *c. .87 d. .08

28. a. .02 *b. .98 c. .00 d. .00

29. a. .01 *b. .97 c. .01 d. 02

30. a. .09 b. .01 c. .01 *d. .90